FOLIA TAXONOMICA 10. NEW SPECIES OF *NAUTILOCALYX* (GESNERIACEAE: EPISCIEAE) FROM THE VENEZUELAN GUAYANA

Christian Feuillet

Department of Botany, MRC-166
Smithsonian Institution
P.O. Box 37012
Washington, D.C. 20013-7012, U.S.A.
feuillec@si.edu

ABSTRACT

Seven species of *Nautilocalyx* are described from the Venezuelan Guayana; **Nautilocalyx crenatus, N. orinocensis,** and **N. ruber** from the state of Amazonas; **N. paujiensis, N. pusillus, N. roseus,** and **N. vestitus** from the state of Bolívar.

RÉSUMÉ

Sept espèces de *Nautilocalyx* sont décrites de Guyane Vénézuélienne; **Nautilocalyx crenatus, N. orinocensis** et **N. ruber** de l'état d'Amazonas; **N. paujiensis, N. pusillus, N. roseus** et **N. vestitus** de l'état de Bolívar.

The numerous collections made in the last 50 years in Bolívar and Amazonas states of Venezuela uncovered several new species. In the Gesneriaceae, the new species have a clear affinity for the mountains, the bases of the tepuis, and the headwaters of nearby rivers. Of course, these locations reflect the nature of the collecting efforts that took place during the last decades. Since the middle of the 20th century, there was a resurgence of interest for the Gesneriaceae of the Guiana Shield (Leeuwenberg 1958; Feuillet & Steyermark 1999; Skog & Feuillet 2008). At the middle of the 20th century, most species currently included in *Nautilocalyx* Linden ex Hanst. were included in *Episcia* Mast. along with many species now placed in *Paradrymonia* Hanst. *Nautilocalyx* was greatly augmented with the redefinition of *Episcia* (Wiehler 1973, 1978). As a group of 57 species currently accepted (including the six described below), it is different from *Episcia* by the lack of stolons (Wiehler 1973) and seems closer to *Chrysothemis* Decne. than to *Episcia* as shown by recent DNA analyses which included one species of *Nautilocalyx* and of *Paradrymonia* (Smith 2000; Zimmer et al. 2002; Clark & Zimmer 2003). All but Smith (2000) placed the *Chrysothemis / Nautilocalyx* clade close to *Paradrymonia*. Clark et al. (2006) sequenced 155 species of the tribe Episcieae, including seven species of *Nautilocalyx* and 13 of *Paradrymonia*. Their analysis showed *Chrysothemis* nested in *Nautilocalyx*, itself nested in *Paradrymonia*. Both *Nautilocalyx* and *Paradrymonia* are in great need of morphological and molecular studies to identify monophyletic groups and of revisions to reflect the resulting clades.

1.—New pink- or red-flowered species of *Nautilocalyx*

Nautilocalyx crenatus Feuillet, sp. nov. (**Fig. 1**). TYPE: VENEZUELA. AMAZONAS: Cerro Yapacana, alrededores del campamento a lo largo del río en las faldas en la parte suroeste, 3°45'N, 66°45'W, 825 m, 4 May 1970 (fl), *J.A. Steyermark & G. Bunting 103068* (HOLOTYPE: US; ISOTYPES: NY, VEN).

Nautilocalyci cataractarum affinis. Planta parviore; sepalis lanceolatis, integris; corollae rubrae, tubo bis longiore; glande non lobata; ovario bis parviore differt.

Saxicolous herb; leaves clustered at apex of short stem; stem densely long-hairy in young parts. Leaves opposite, equal in a pair: petiole lacking to 1 cm long, densely villous, trichomes 3.5–4.5 mm long; blade elliptic to oblanceolate, 2.5–8 × 1.2–2.7 cm, base attenuate to decurrent, apex obtuse to slightly acute, margin crenate to mostly bi-crenate, laxly ciliate, adaxially rugose, deep green or bronze, and laxly pilose with trichomes 1–1.5 mm long, abaxially lavender or purplish, densely antrorsely pilose on main veins, less so on veinlets, each side of the midrib 6–7 strongly ascending main lateral veins anastomosing 3–5 mm from the margin.

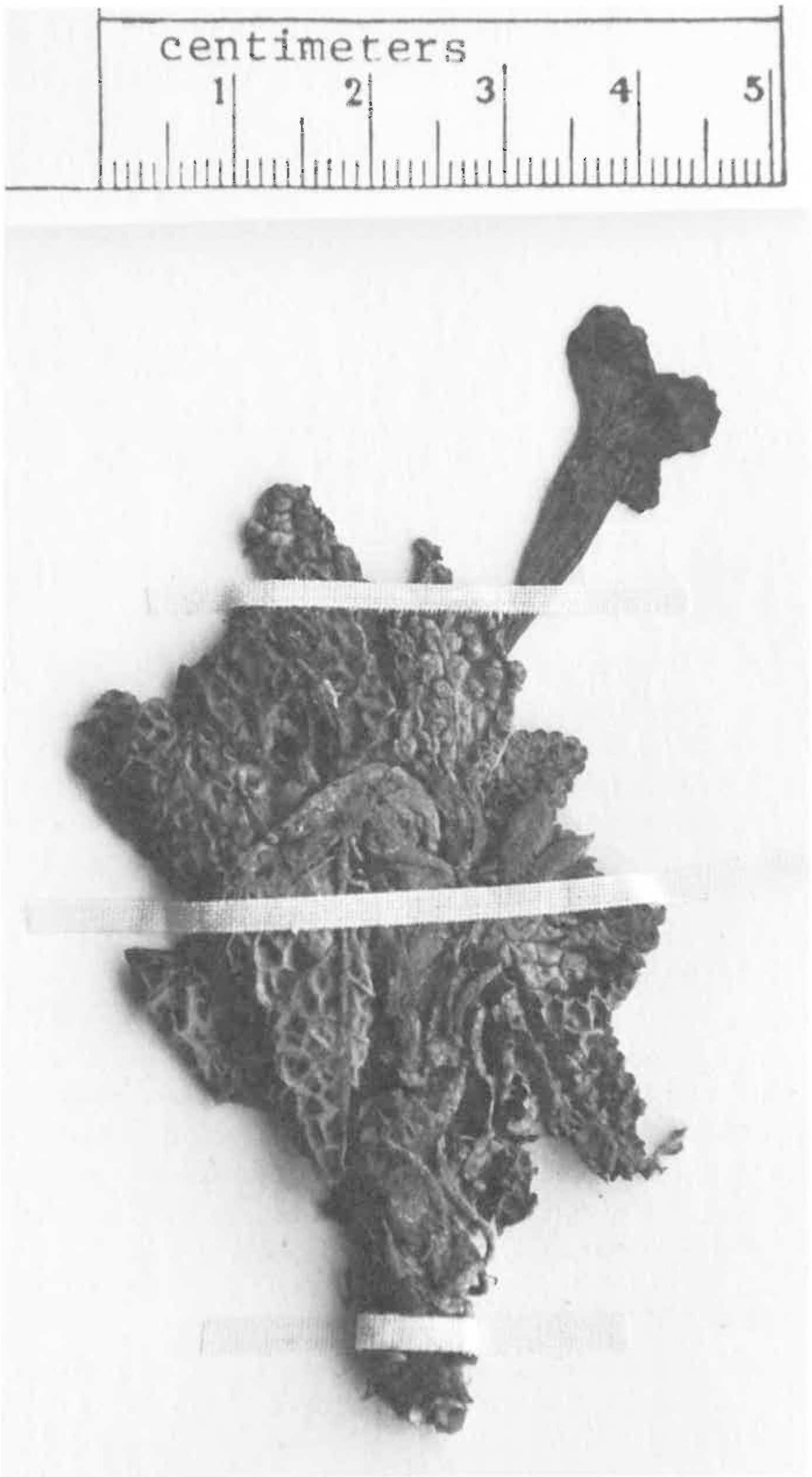

Fig. 1. *Nautilocalyx crenatus*, photograph by C. Feuillet of *Steyermark & Bunting 103180* (paratype: US)

Inflorescence a reduced pair-flowered cyme, axillary, appearing fasciculate, with several flowers, pedicels 1.5–1.7 cm long densely appressed-villous. Flowers: sepals free, oblanceolate to oblong, slightly unequal, the larger 4–6 × 2 mm, the smaller 3–4 × 1–1.5 mm, margin 0–3-crenate on each side near apex, densely villous outside, sparsely pilose near apex within; corolla red, posture oblique to nearly transverse in the calyx, spur narrow-oblong, 5 × 1–1.5 mm, glabrous, tube 2.3–3 cm long, 0.6 cm wide at throat, appressed-villous outside, lobes suborbicular, 7 × 7 mm, sparsely appressed-pilose outside, glabrous within; stamens

with anthers suborbicular-oblong, 1.2 × 0.9 mm; nectary gland dorsal, ovate, 1 mm long, apex obtuse to rounded, glabrous; ovary long-ovoid, 2 × 1 mm, densely sericeous, style glabrous. Fruit not seen.

Distribution.—*Nautilocalyx crenatus* is known from Cerro Yapacana (Amazonas, Venezuela) where it grows in crevices and on wet rocks, 800–1200 m. It was flowering in May.

Nautilocalyx crenatus resembles *N. cataractarum* Wiehler, from the state of Bolívar, in habitat, habit, and leaf texture. It differs from *N. cataractarum* by an overall smaller plant habit and has flowers with sepals entire at margin, a truly red corolla with a longer and nearly straight tube, an unlobed dorsal nectary gland, and an ovary half the size. *Nautilocalyx crenatus* was *Nautilocalyx* "sp. F" in Feuillet and Steyermark (1999).

Etymology.—The epithet *crenatus* refers to the crenate or bi-crenate margin of the leaf blades.

PARATYPE: **VENEZUELA. Amazonas:** Cerro Yapacana, en la cumbre, 3°45'N, 66°45'W, 1000–1200 m, 5–7 May 1970 (fl), *J.A. Steyermark & G. Bunting 103180* (US, VEN).

Nautilocalyx paujiensis Feuillet, sp. nov. (**Fig. 2**). TYPE: VENEZUELA. BOLÍVAR: 17 km E of El Paují by road and 64 km W of Santa Elena by road, 4 km N of highway, Río Las Ahallas, ca. 4°30'N, 61°30'W, 850 m, 28 Oct 1985 (fl), *R.L. Liesner 19044* (HOLOTYPE: US; ISOTYPES: MO, VEN).

Nautilocalyci kohlerioidi affinis; tota planta per pilos rubros vestita, lamina basi obtusa vel acuta, floribus fasciculatis, sepalis bis brevioris, oblanceolatis, corollae tubo longi-hirsuto differt.

Terrestrial herb, decumbent, 25–45 cm tall; stem hirsute, trichomes 3–4 mm long, red, internodes 5–12 cm long. Leaves opposite and decussate, equal in a pair: petiole 2–5 cm long, hirsute, trichomes red; blade elliptic to oblanceolate, 7–13 × 3.5–5.5 cm, base asymmetrical, obtuse to acute, often rounded at very base, apex obtuse, sometimes shortly and widely acuminate, margin crenate to bicrenate with sinuses always acute and teeth rarely so, adaxially appressed-pubescent, surface flat, abaxially pubescent-hirsute on veins, on both sides trichomes of dried specimens hyaline, 7–10 main veins on each side of the midrib. Inflorescence a reduced pair-flowered cyme, axillary, appearing fasciculate, with 3–10 flowers; pedicels 1–4 cm long, hirsute, trichomes red. Flowers: sepals free, oblong to ovate, 6–8 × 2–3 mm, with few teeth toward apex, hirsute on both sides, trichomes red; corolla posture slightly oblique in the calyx, red, hirsute outside, trichomes red, 3–4 mm long, basal gibbosity rounded, 2.5 mm long, 2–2.5 mm wide, tube 2–2.5 cm long, wider 2/3 from base, somewhat narrowed at the throat, lobes suborbicular, 5 × 5 mm, margin entire, glabrous within, outside hirsute at base, androecium and gynoecium not seen (flowers glued). Young fruit ovoid, nearly as long as the reddish calyx, hirsute.

Distribution.—*Nautilocalyx paujiensis* is known only from the type specimen collected 17 km east of El Paují (Bolívar, Venezuela) were it was growing on mossy rocks and cliffs at 850 m elevation. It was collected with a few flowers and young fruits in October.

Nautilocalyx paujiensis resembles *N. kohlerioides* (Leeuwenb.) Wiehler, from the basin of the Oyapock river in Amapá (Brazil) and French Guiana. It differs from *N. kohlerioides* by the red indumentum, the leaf blades obtuse to acute at the base, the fasciculate flowers with oblanceolate sepals half the size and by the hirsute indumentum on the corolla tube. *Nautilocalyx paujiensis* was *Nautilocalyx* "sp. D" in Feuillet and Steyermark (1999).

Etymology.—The new species is named for the community of El Paují near which the species was discovered.

Nautilocalyx pusillus Feuillet, sp. nov. (**Fig. 3**). TYPE: VENEZUELA. BOLÍVAR: near El Paují, Río Cabass, waterfall, 4°30'N, 61°35'W, 800–900 m, 3 Nov 1985 (fl), *R.L. Liesner 19429* (HOLOTYPE: US; ISOTYPES: MO, VEN).

Nautilocalyci porphyrotrichi affinis; lamina floreque parvioris, corollae non gibbosa, glande non lobata, ovario ter breviore differt.

Saxicolous herb; whole plant hirsute or appressed-pubescent except the stamens and the style. Leaves opposite, equal or unequal in a pair: petiole lacking or to 3 cm long, densely strigose; blade linear-oblanceolate to narrowly oblanceolate, 4.5–15 × 0.7–3.5 cm, base decurrent, apex acute to acuminate, margin minutely serrate to bi-serrate on the apical 3/4, adaxially gray appressed-pubescent, abaxially hirsute on veins, with 5–6 main lateral veins on each side of the midrib, strongly ascending, ending near the margin but not clearly

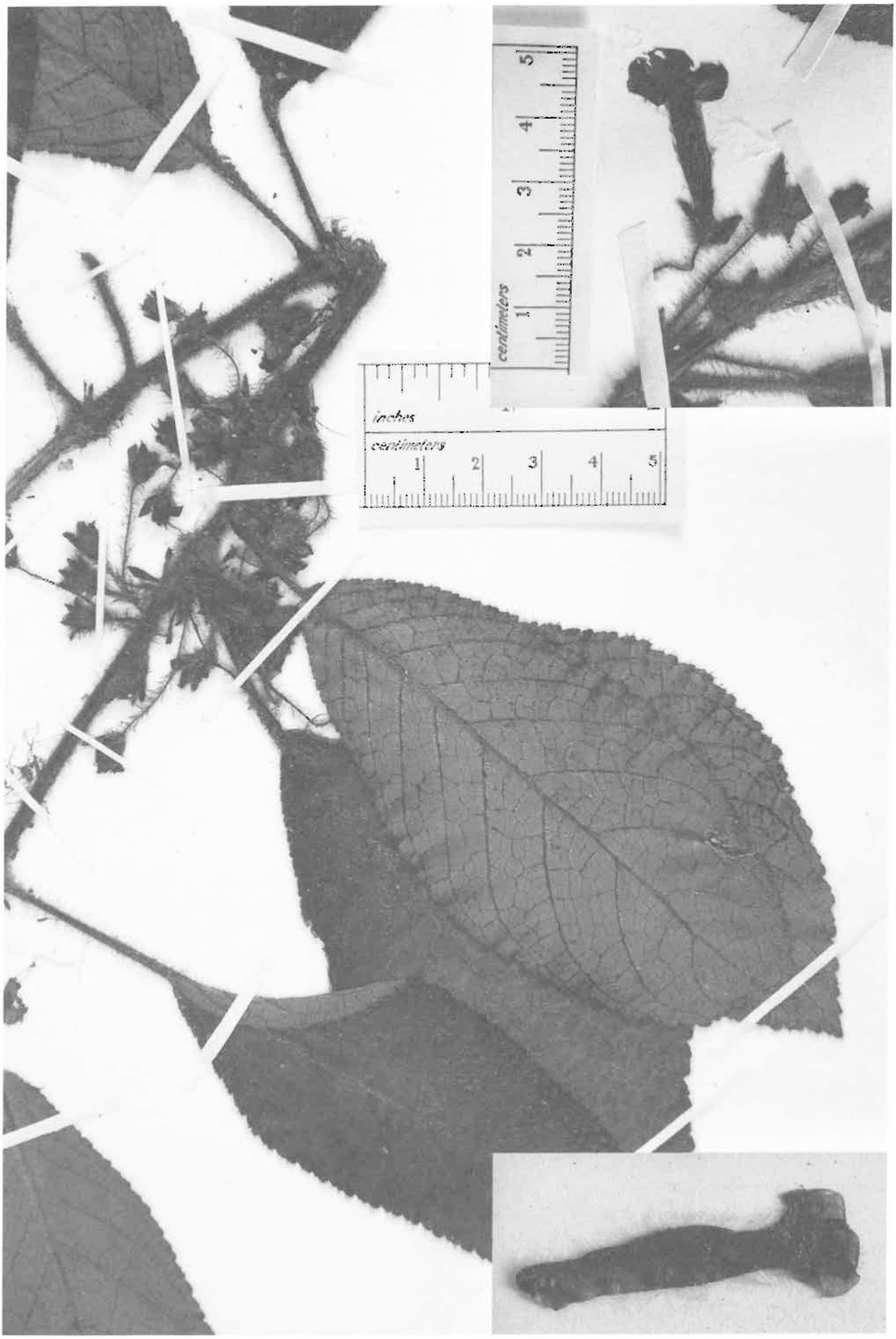

FIG. 2. *Nautilocalyx paujiensis*, photographs by C. Feuillet of *Liesner 19044* (main, holotype: US; top insert, isotype: VEN; bottom insert holotype, corolla total length 3.2 cm for scale)

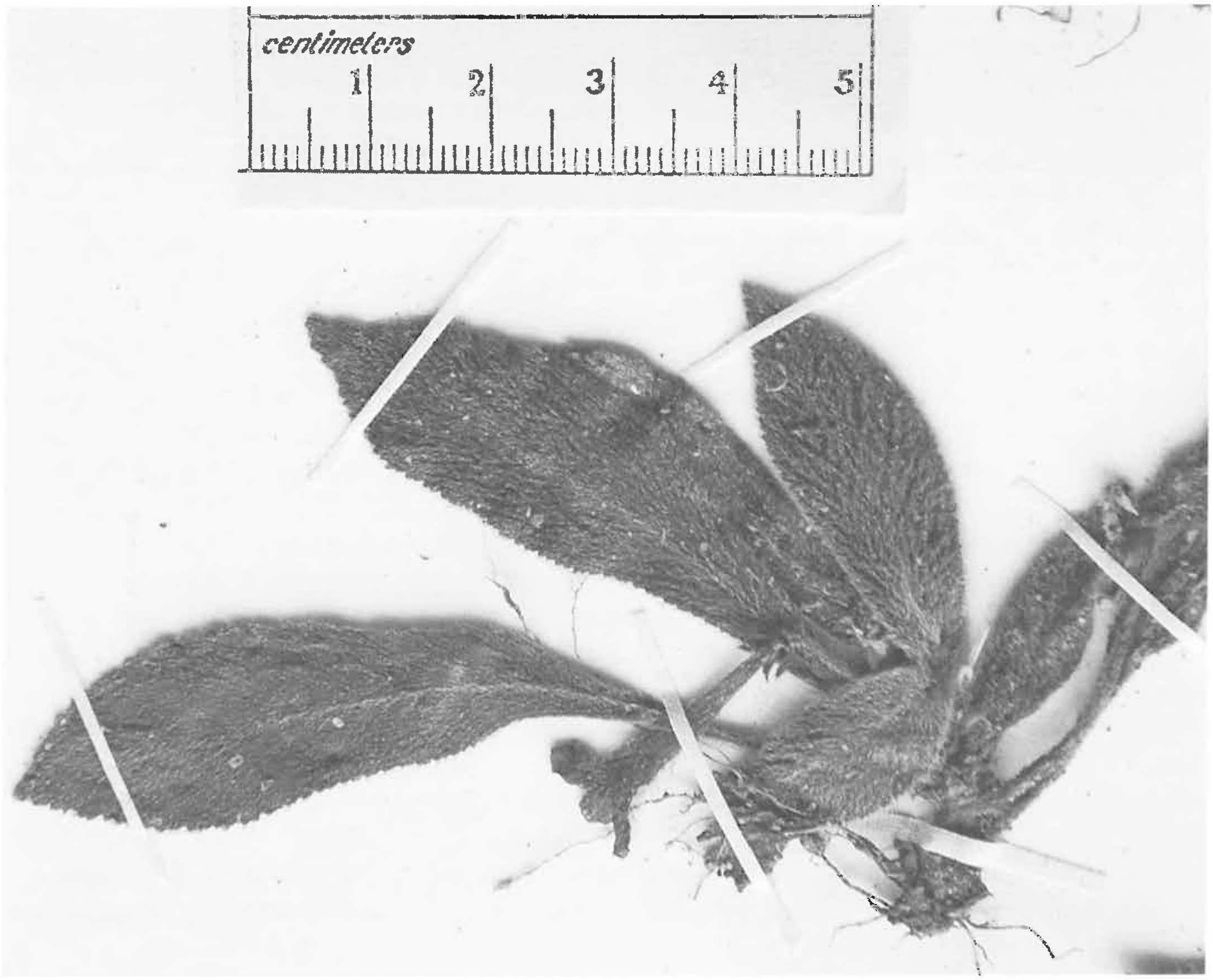

FIG. 3. *Nautilocalyx pusillus*, photograph by C. Feuillet of *Liesner 19429* (holotype: US)

anastomosing. Inflorescence a reduced pair-flowered cyme, axillary, appearing fasciculate, 1–2-flowered, pedicels 13–20 mm long, densely villous with purplish red spreading-ascending, 1.5 mm long trichomes. Flowers: calyx with lobes free or nearly so, connate for 0–2 mm, lobes subequal, narrowly to linear lanceolate, 4–5 × 0.7–1 mm, acute at apex, densely hirsutulous outside, glabrous except near apex within; corolla posture straight in the calyx, scarlet, not gibbous at base, tube 1.5–2 cm long, densely hirsute outside except in the calyx, glabrous within, lobes unequal, upper 2 rounded, 2 × 2.5 mm, lower 3 ovate–oblong, 4 × 2.5 mm; stamens 4: filaments 8 mm long, inserted on the corolla 6 mm from the base, glabrous, anthers coherent in 2 pairs, sagittate, 1.2 × 1 mm; gland oblong-lanceolate, 1.2 mm long, sulcate in upper half; ovary ovoid, 1.5 × 1 mm, sericeous, style 9 mm long, glabrous, stigma bilobed, lobes short, eventually growing to 1 mm long. Fruit not seen.

Distribution.—*Nautilocalyx pusillus* grows on boulders or in bluff crevices, 500–900 m, near El Paují and Icabarú (Bolívar, Venezuela). It was flowering October to December.

Nautilocalyx pusillus resembles *N. porphyrotrichus* (Leeuwenb.) Wiehler, from Guyana and Venezuela. It differs from *N. porphyrotrichus* by the smaller size of the leaves and the flowers, especially its ovary 1/3 the size, and by the lack of a basal gibbosity ("spur"). *Nautilocalyx pusillus* resembles also young *N. arenarius* L.E. Skog & Steyerm., but this latter species has cup-shaped calyces with short lobes and white corollas twice the size. *Nautilocalyx pusillus* was *Nautilocalyx* "sp. G" in Feuillet and Steyermark (1999).

Etymology.—The epithet *pusillus* refers to the small size of the plant.

PARATYPES: **VENEZUELA. Bolívar:** 4 km of El Paují, Río Chaberú, 750–900 m, 4°30'N, 61°36'W, 12 Nov 1985 (fl), *R.L. Liesner 19904* (US); 5 km S of El Paují, "El Abismo", Río Samay, affluent of Río Icabarú, 4°23'N, 61°38'W, 520 m, 23 Oct 1985 (fl), *R.L. Liesner & B.K. Holst 18978* (MO, US, VEN); a lo largo de la quebrada El Cajón, Puente Luís Raúl Vasquez Z., 26.5 km al este de Icabarú, 4°25'N, 61°32'W, 750 m, 18 Dec 1978 (fl), *J.A. Steyermark, V. Carreño Espinosa & G. C. K. Dunsterville & E. Dunsterville 117834* (SEL, VEN).

Nautilocalyx roseus Feuillet, sp. nov. (**Fig. 4**). TYPE: VENEZUELA. BOLÍVAR: N side of Auyan tepui, along banks of Quebrada Honda, Mar 1969 (fl), *G.C.K. Dunsterville & E. Dunsterville s.n.* (HOLOTYPE: VEN).

Nautilocalici cataractarum affinis; internodo longiore, pedicellis longioribus, calycis lobis angustioribus, corollae tubo breviore, cylindraceo, antheris discretis, stylo breviore differt.

Terrestrial herb, decumbent; stems at least 10 cm long, densely appressed-pubescent, internodes 4–5 cm long. Leaves opposite, decussate, equal or subequal in a pair: petiole densely villous, 1.5–2.5 cm long; blade elliptic-oblanceolate or broadly oblanceolate, 10.5–11.5 × 3.8–4.5 cm, base cuneate, apex acute, margin densely serrulate except at base, adaxially densely appressed villous, abaxially appressed villosulous mainly on the veins, 6–7 main veins on each side of the midrib, ascending, anastomosing near the margin. Inflorescence a reduced pair-flowered cyme, axillary, appearing fasciculate, up to 12-flowered; pedicels slender, 15–20 mm long, densely villosulous, trichomes 1–1.5 mm long. Flowers small: calyx fused at base, cup 1 mm long, 3 mm wide, lobes linear-lanceolate, 5 × 0.7–0.8 mm, apex acute with a sclerified, cylindrical, blunt tip, densely villosulous outside, trichomes 0.7–1.5 mm long, villosulous inside in apical half, glabrous in basal half; corolla tubular, tube "pale gray rose", 12 mm long, 3.5 mm wide for most of the length, slightly dorsally gibbous making the base rounded and moving the insertion on the receptacle in a ventral position, glabrous ventrally in the basal 4 mm, otherwise villous, lobes suborbicular, "deep rose", the two dorsal ones 4.5 × 3 mm, rounded, glabrous on both sides, the three others rounded, 3 × 3 mm, without pubescent in basal part, otherwise glabrous, within glabrous; stamens four, included, inserted 3 mm from the base of the corolla, filaments base lanceolate, 2 × 0.8 mm, sparsely ciliolate, apex filamentose, 5–6 mm long, spirally twisted, glabrous, anthers not coherent, bilobed in basal half, 1 × 0.8 mm; nectary gland dorsal, about 1 × 0.5 mm, bilobed, glabrous; ovary narrowly ovoid, 2 × 1–1.3 mm, acute, densely sericeous, style glabrous, 6.5 mm long, stigma bilobed. Fruits not seen.

Distribution.—Known only from the type collection from Quebrada Honda, north of Auyan Tepui, about 10 km west of Angel Falls in Parque Nacional Canaima. It was in bloom in March.

Nautilocalyx roseus was annotated by H. Wiehler as *Nautilocalyx sp. aff. melittifolius* (L.) Wiehler and later by J.A. Steyermark as an elongated-stemmed form of the rosulate *N. cataractarum* Wiehler. In spite of some similarities and of the geographical proximity of the type localities, *N. roseus* can be separated from *N. cataractarum* (type from the base of Angel Falls) by a series of characters. The leaf margin of *N. roseus* is serrate versus crenate and the pedicels are 15–20 vs. 5–10 mm long. The calyx lobes are fused into a cup at base vs. free and their width is 0.7–0.8 vs. 1.2 mm. The corolla tube is cylindrical vs. ventricose and the lobes are 3 mm wide and unequal (2 dorsal longer) vs. 5–7 mm wide and equal (or the 2 dorsal slightly shorter). In the stamens, the anthers are free vs. coherent in a group of four and the filaments are spirally twisted vs. not twisted. Finally the style is 6.5 vs. 9–10 mm long. *Nautilocalyx melittifolius* from the Lesser Antilles is clearly different with pedunculate inflorescences, calyx lobes 3–7 mm wide, and ovary 4–5 mm long.

Etymology.—Named *roseus* for the color "rose" (according to the specimen-label) of the corolla.

Nautilocalyx ruber Feuillet, sp. nov. (**Fig. 5**). TYPE: VENEZUELA. AMAZONAS: Dept. Atures, 4 km of Río Coro-Coro, W of Serranía de Yutajé, 9 km NW of settlement of Yutajé, along stream on plateau north of unnamed 1760 m peak, 5°41'N, 66°10'W, 1050–1300 m, 7 Mar 1987 (fl), *R.L. Liesner & B.K. Holst 21728* (HOLOTYPE: US; ISOTYPE: MO, VEN).

Nautilocalyci maguirei affinis; lamina angusto-oblanceolata, parviore, petiolo multo beviore, sepalis oblanceolatis, intus glabris, corollae tubo breviore differt.

Terrestrial or saxicolous herb; stem pubescent to densely villous with 1–1.5 mm long spreading trichomes. Leaves opposite, unequal in a pair: petiole lacking or to 3 cm long, densely villous; blade oblanceolate, 6–17 × (1.5–)2–5.5 cm, base appearing decurrent but mostly long narrowly attenuate and asymmetrically

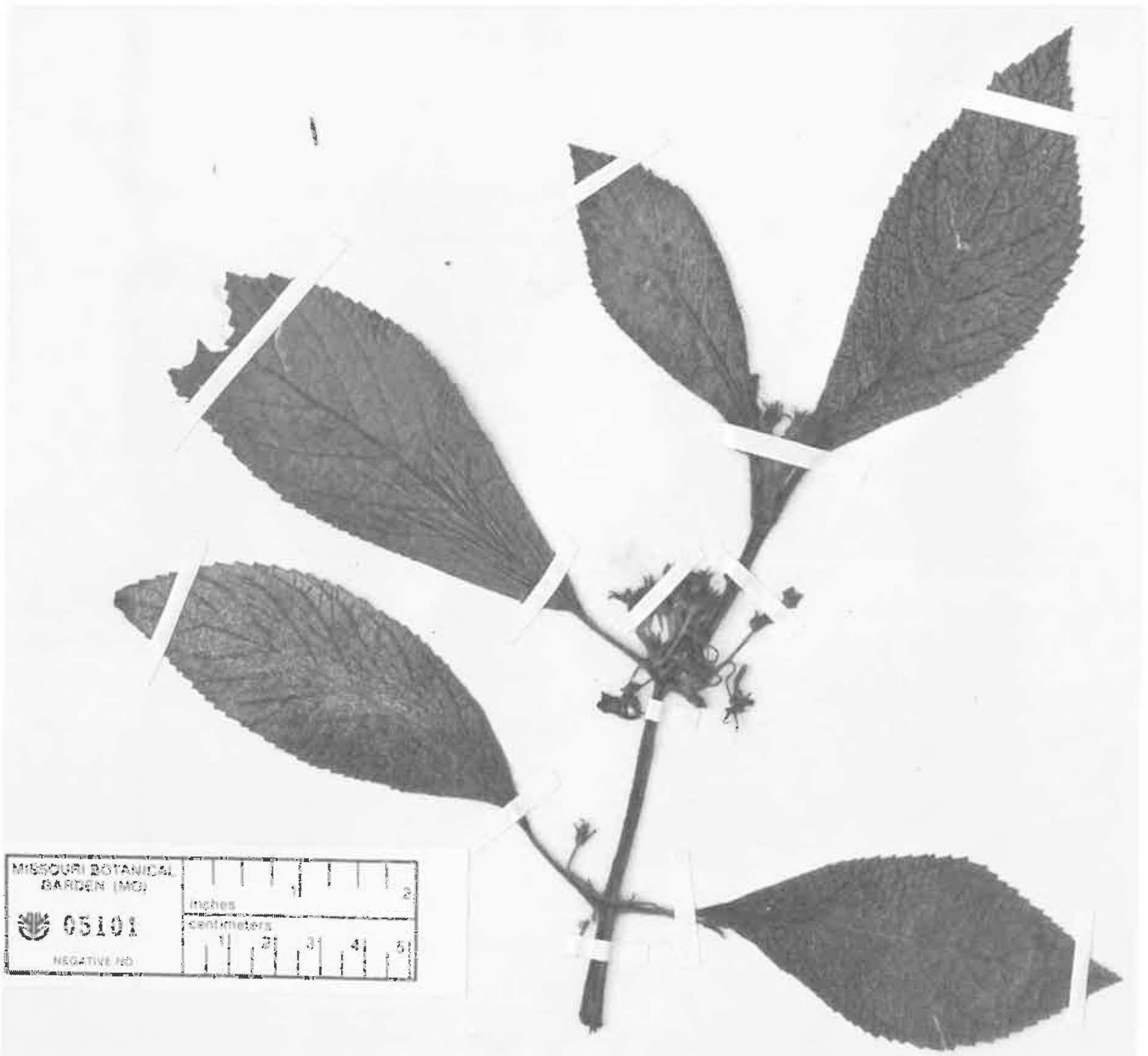

Fig. 4. *Nautilocalyx roseus*, photograph by C. Feuillet of *Dunsterville & Dunsterville s.n.* (holotype: VEN)

rounded at very base, apex rounded to acute, margin ciliate and wide crenate to bi-crenate, adaxially bullate, silvery around the midrib, with 2–3 mm long trichomes on top of the bullae, otherwise glabrous, abaxially conspicuously reticulate with areolae 2–4 mm diam., villosulous on the main vein, each side of the midrib with 8–13 main lateral veins anastomosing 3–5 mm from the margin. Inflorescence a reduced pair-flowered cyme, axillary, appearing fasciculate, pedicels slender, appressed-villous, 1.5–2 cm long. Flowers: sepals subequal, free, oblanceolate, 6–8 × 1.5–2 mm, sparsely to densely pilosulous outside, with 1–few teeth near apex and ciliate at margin, glabrous inside; corolla red to orange-red, tube 2.5–3.5 cm long, 3 mm wide at base, 6 mm at throat, sparsely puberulent outside, glabrous within except near throat where sparsely papillate, lobes 7 × 5 mm, the ventral one up to 9 × 6 mm, short appressed-pubescent outside; stamens: filaments broadened at base where minutely ciliate, otherwise glabrous, anthers broadly oblong, cordate at base, rounded at apex, 1.2 × 0.9 mm; nectary gland dorsal, 0.8–0.9 mm long and wide, obscurely 3 lobed at apex, sulcate near base; ovary ovoid, 3.5 × 1.5 mm, short sericeous, style glabrous, 2 cm long. Fruit (ripe?) ovoid, acute at apex, about 6 × 4 mm, pilosulous at apex.

Distribution.—Nautilocalyx ruber has been collected on the Serranía de Yutajé and Cerro Sipapo (Amazonas, Venezuela) on stream banks or mossy rocks, 300–1500 m. It was flowering in December and February-March, and fruiting in December.

The leaves of *Nautilocalyx ruber* are distinctive from other congeners. Their texture is reminiscent of *N. maguirei* L.E. Skog & Steyerm. and of *N. pemphidius* L.E. Skog, but the blades are oblanceolate, long attenuate,

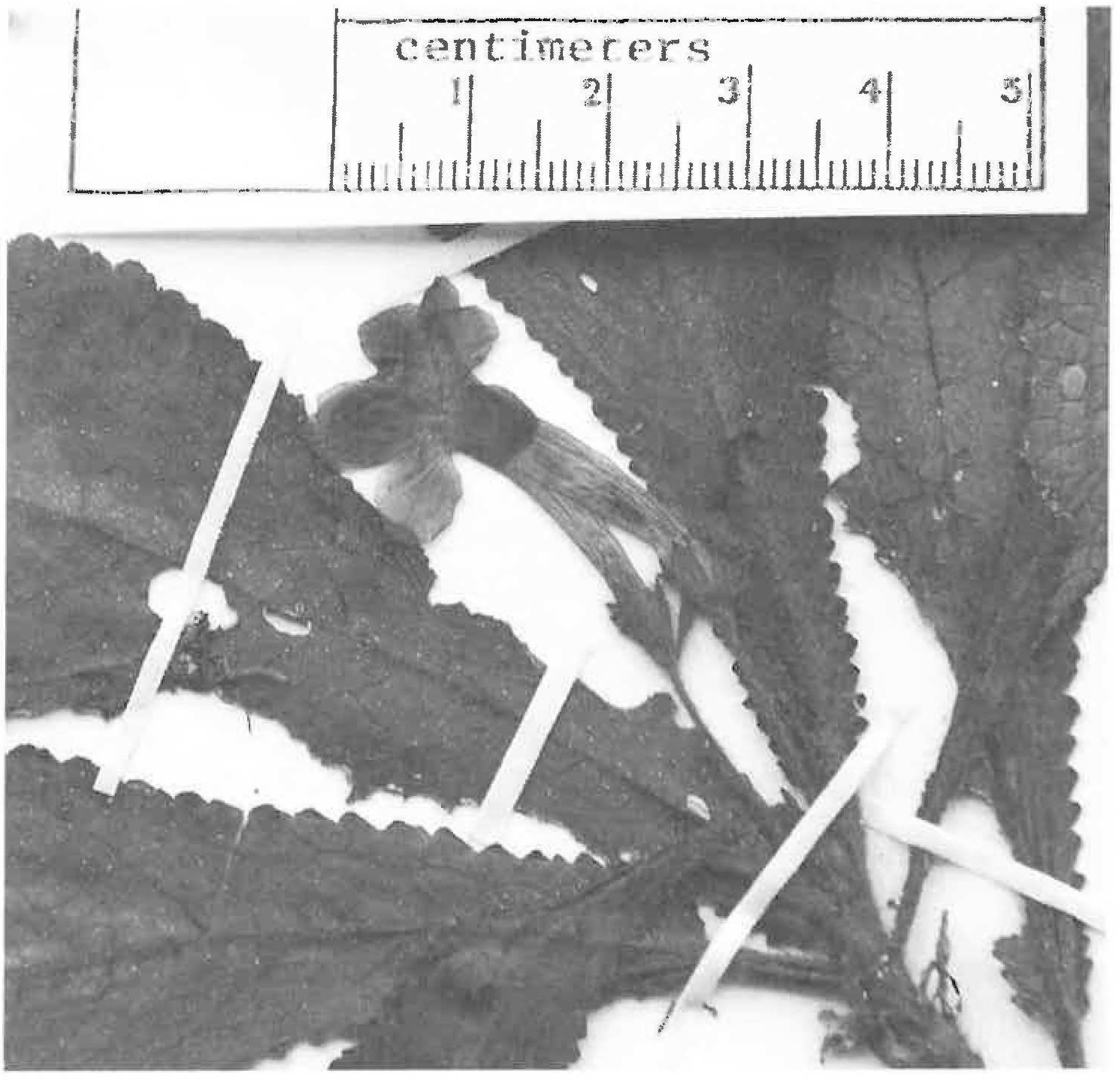

FIG. 5. *Nautilocalyx ruber*, photograph by C. Feuillet of *Liesner & Holst 21708* (holotype: US, corolla total length 3.2 cm for scale)

nearly decurrent to the petiole, but asymmetrically rounded at the narrow base. It differs from the white-flowered *N. pemphidius* by its much larger and orange-red corollas, and from the red-flowered *N. maguirei* by the shape and smaller size of the leaf blades, by the much shorter petioles, by the sepals oblanceolate and glabrous adaxially, and by the shorter corolla tube. *Nautilocalyx ruber* was *Nautilocalyx* "sp. E" in Feuillet and Steyermark (1999).

Etymology.—Named *ruber* for the red color of the corolla.

PARATYPES: **VENEZUELA. Amazonas:** Dept. Atures, Río Coro-Coro, stream and slopes E of river, W of Serranía de Yutajé, 6 km N of settlement of Yutajé, 5°41'N, 66°07'W, 320 m, 21 Feb 1987 (fl), *R.L. Liesner & B.K. Holst 21300* (MO, US, VEN); Serranía de Yutajé, Caño Yutajé, 1500 m, 21 Feb 1953 (fl), *B. Maguire & C. K. Maguire 35368* (NY, US); Cerro Sipapo, between Phelps Camp and North Savanna, 1400 m, 17 Dec 1948 (fl & fr), *B. Maguire & L. Politi 27746* (NY, US, US).

Although the color of the corolla is not considered here as a proof of phylogenetic relationship, for practical reasons it might be useful to present the following key.

KEY TO THE PINK- OR RED-FLOWERED *NAUTILOCALYX* FROM THE VENEZUELAN GUAYANA

1. Leaf blade ovate or obovate _____ **N. chimantensis** L.E. Skog & Steyerm.
1. Leaf blade elliptic or oblanceolate.
   2. Leaf blade surface flat.
      3. Leaf blades 12–30 cm long; calyx lobes about 10 times as long as wide _____ **N. fasciculatus** L.E. Skog & Steyerm.
      3. Leaf blades 6–12 cm long; calyx lobes about 3–7 times as long as wide.
         4. Stem appressed-pubescent; calyx lobes linear-lanceolate, forming a short cup at the base _____ **N. roseus** Feuillet
         4. Stem hirsute; calyx lobes oblong to ovate, free _____ **N. paujiensis** Feuillet
   2. Leaf blade bullate.
      5. Leaf blade oblanceolate.
         6. Corolla tube up to 2.5 cm long _____ **N. maguirei** L.E. Skog & Steyerm.

6. Corolla tube more than 2.5 cm long _____ **N. ruber** Feuillet

5. Leaf blade elliptic.

7. Petiole up to 1.5 cm long.

8. Corolla tube about 1.5 cm long _____ **N. cataractarum** Wiehler

8. Corolla tube about 2 cm long _____ **N. crenatus** Feuillet

7. Petiole more than 2 cm long.

9. Calyx lobes entire; corolla tube 2–3 cm long _____ **N. pusillus** Feuillet

9. Calyx lobes dentate; corolla tube 3–5 cm long _____ **N. porphyrotrichus** (Leeuwenb.) Wiehler

2.—New white-flowered species of *Nautilocalyx*

Nautilocalyx orinocensis Feuillet, sp. nov. (**Fig. 6**). TYPE: VENEZUELA. AMAZONAS: Upper Orinoco river, Sierra Guaharibo, near Raudal de los Guaharibos, slopes of "Mt. Rimbaud," light growth near the top, 30 Jul 1951 (fl), *L. Croizat 429* (HOLOTYPE: NY; photograph MO, negative # 05102).

Nautilocalyci bryogeton affinis; floribus latioribus, sepalo bis longiore, corollae tubo ter longiore differt.

Terrestrial or saxicolous (?) herb; shortly pubescent throughout; internodes very short, leaves remaining only on the young growth. Leaves opposite, equal in a pair: petiole 4–6 cm long, densely villous; blade obovate, 7–9 × 3–5 cm, base narrowed and then rounded, slightly emarginate and asymmetric, apex broadly rounded to obtuse, margin obscurely crenate, adaxially densely and minutely appressed-pubescent, abaxially densely appressed pubescent on main veins, loosely so on the tertiary veins and glabrescent between the veins, 4–6 main veins on each side of the midrib. Inflorescence a reduced pair-flowered cyme, axillary, appearing fasciculate, 2–4-flowered; pedicels 8–10 mm long, densely villous. Flowers: sepals narrowly lanceolate, 11 × 1.5 mm, densely villous on both sides, ciliate at margin; corolla white, spur narrow, 2 × 1 mm, tube more than 3 cm long, densely villous outside (only corolla damaged, partly hidden by leaves, glued on the herbarium sheet), glabrous within with papillae in apical part (in bud), lobes glabrous on both sides (in bud); stamens recoiled in the basal third of the tube; nectary gland dorsal, ligulate-oblong, 1 × 0.6 mm; ovary narrowly ovoid, 2 mm long, densely hirsutulous, style more than 1.5 cm long. Fruit subglobose, 5 × 5 mm, densely pubescent.

Distribution.—*Nautilocalyx orinocensis* was discovered near the top of a slope on "Mt. Rimbaud," Sierra Guaharibo (Amazonas, Venezuela), in "light growth," near the Upper Orinoco. It was flowering and fruiting in July.

Nautilocalyx orinocensis resembles *bryogeton* (Leeuwenb.) Wiehler from Guyana. It differs from *N. bryogeton* by much larger flowers: sepals 11 × 1.5 mm (versus 4–6 × 1–1.5 mm), corolla tube, more than 3 cm long (versus 1.2 cm), ovary narrowly ovoid, 2 mm long (versus globose, 1 mm long). The two species are similar in their vegetative parts. *Nautilocalyx orinocensis* was *Nautilocalyx* "sp. B" in Feuillet and Steyermark (1999).

Etymology.—The new species is named *orinocensis* after the Orinoco river.

Nautilocalyx vestitus Feuillet, sp. nov. (**Fig. 7**). TYPE: VENEZUELA. BOLÍVAR: Cumbre del Cerro Guaiquinima, a lo largo del affluente del Río Carapo, 1 km río arriba del Salto Szczerbanari, 5°44'N, 63°41'W, 730–750 m, 23–24 May 1978 (fl), *J.A. Steyermark, P. Berry, G. C. K.Dunsterville & E. Dunsterville 117244* (HOLOTYPE: VEN).

Planta tota vestita, praeter supra nervos medios et laterales dense hirsuta, lamina serrata vel crenata, sepala angustato-lanceolata, corolla alba.

Saxicolous herb; stems covered with long brown trichomes. Leaves opposite, decussate, equal or subequal in a pair: petiole 1–2.5 cm long, covered with long brown trichomes; blade obovate, 3–7 × 2–3.5 cm, covered with long white trichomes, base acute to cuneate, apex rounded to obtuse, margin serrate-crenate, adaxially densely pilose except on main veins, abaxially densely pilose, main veins 6–8 on each side of the midrib. Inflorescence a reduced pair-flowered cyme, axillary, appearing fasciculate, 1–3-flowered; pedicels 4–5 mm long, covered partly by the indumentum of the stem, covered with short trichomes. Flowers: sepals linear-lanceolate, 6–7 × 1–2 mm, pale green, covered with long white trichomes, apex curved outward in bud; corolla white in young bud (according to the specimen-label). Fruit not seen.

Fig. 6. *Nautilocalyx orinocensis*, photograph by C. Feuillet of *Croizat 429* (holotype: NY)

Distribution.—*Nautilocalyx vestitus* was found on the Cerro Guaiquinima (Bolívar) in Venezuela, on shaded bluffs of narrow rocky quebrada along a small stream, 730–750 m. It was in flower bud in May.

Nautilocalyx vestitus is unique among the *Nautilocalyx* species by its vegetative characters. It shares with *Episcia duidae* Feuillet, *E. rubra* Feuillet, and an undescribed *Paradrymonia*, from the state of Amazonas, a long and dense indumentum usually characteristic of plants able to survive exposed to strong winds. It will be

FIG. 7. *Nautilocalyx vestitus*, photograph by C. Feuillet of *Steyermark et al. 117244* (holotype: VEN)

necessary to study an open flower to assess the relationships of *N. vestitus* with other species of *Nautilocalyx*. *Nautilocalyx vestitus* was *Nautilocalyx* "sp. A" in Feuillet and Steyermark (1999).

Etymology.—The epithet *vestitus* refers to the dense, brownish or white indumentum that covers the stems and leaves of the plant.

KEY TO THE WHITE- OR LAVENDER-BLUE-FLOWERED *NAUTILOCALYX* FROM THE VENEZUELAN GUAYANA

1. Leaf blade ovate or obovate.
   2. Leaf blade ovate ____ **N. adenosiphon** (Leeuwenb.) Wiehler
   2. Leaf blade obovate.
      3. Lower surface of leaves with tertiary veins hidden by long hairs ____ **N. vestitus** Feuillet
      3. Lower surface of leaves with tertiary veins obvious.
         4. Leaf blade narrowly rounded; corolla white ____ **N. orinocensis** Feuillet
         4. Leaf blade widely rounded; corolla tube white, lobes lavender blue ____ **N. cordatus** (Gleason) L.E. Skog
1. Leaf blade elliptic or oblanceolate.
   5. Leaf blade surface bullate.
      6. Leaf blade oblanceolate, margin large-crenate ____ **N. pemphidius** L.E. Skog
      6. Leaf blade elliptic, margin short-crenate-serrate ____ **N. resioides** (Leeuwenb.) Wiehler
   5. Leaf blade surface flat.
      7. Leaf blade not decurrent on the petiole ____ **N. arenarius** L.E. Skog & Steyerm.
      7. Leaf blade decurrent on the petiole.
         8. Leaves and bracts reddish ____ **N. punctatus** Wiehler
         8. Leaves and bracts green or whitish ____ **N. pallidus** Sprague

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